Attachment A

Docket No.: 616562000300
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Marie HOLMGREN

Application No.: 10/581,507

Confirmation No.: 8409

Filed: (Intl.) April 25, 2007

Art Unit: 1651

For: FERMENTATION PROCESS, STARTER CULTURE AND GROWTH MEDIUM

Examiner: K. Ariani

DECLARATION OF PETTER GUSTAFSSON UNDER 37 C.F.R. §1.132

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Petter Gustafsson, declare as follows:

1. I received a Ph.D in Microbiology from the University of Umeå, Sweden on May 25, 1977. I have been actively involved in Microbiology and Molecular Biology for over 25 years. My curriculum vitae is attached hereto as Exhibit A.

2. I, Petter Gustafsson, am a consultant to SweTree Technologies AB. Together with 44 other researchers Petter Gustafsson owns shares in the investment company Woodheads AB that owns 25 % of SweTree Technologies AB.

3. I am not a named inventor of US Patent Application No. 10/581,507.

4. I have read US Patent Application No. 10/581,507, the document entitled "Internal Report from Week 44," attached hereto as Exhibit B, the 2008 Journal of Applied Microbiology article of Holmgren and Sellstedt Identification of white-rot and soft-rot fungi increasing ethanol production from spent sulfite liquor in co-culture with *Saccharomyces cerevisiae*, attached hereto as Exhibit C and the document entitled "Experimental data Week 43-2008", attached hereto as Exhibit D.

5. As I understand it, the application is drawn to a process for the production of ethanol from fermentation of organic starting materials using a mix of fungi including fungi of the genuses *Chalara* and *Trametes*.

6. As I understand it, the document entitled "Internal Report from Week 44" presents test data showing that use of a mix of fungi belonging to the genus *Chalara* and to the genus *Trametes* would produce 2-4 times more ethanol than single use of these fungi, under similar conditions. The data indicates that the mix of fungi produced 24.6 grams/liter of ethanol under the test conditions. In contrast, *Chalara* alone produced 6,1 grams/liter of ethanol under the same test conditions. The new provided data produced week 41 entitled "Experimental data Week 43-2008" presents test data showing that use of , *Trametes* alone produced 9.2 grams/liter of ethanol under the very similar test conditions.

7. As I understand it, the new provided data produced week 41 entitled "Experimental data Week 43-2008" presents test data showing that use of a mix of fungi belonging to the genus *Chalara* and to the genus *Trametes* would produce 2-4 times more ethanol than single use of these fungi, under similar conditions. The data indicates that the mix of fungi produced 15.9 grams/liter of ethanol under the test conditions. In contrast, *Chalara* alone produced 8.5 grams/liter (yeast) of ethanol under the same test conditions. Similarly, *Trametes* alone produced 9.2 grams/liter of ethanol under the same test conditions.

8. The observed increased ethanol yield using the mix of *Chalara* and *Trametes* fungi is an unexpected result. In my experience, one would expect the mix of fungi to have an ethanol production rate equal to their individual production rates. The observed results are at least two times more than one would have expected.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements

may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Umeå Oct 27, 2008

Date

Petter Gustafsson

sf-2570332

CURRICULUM VITAE

Petter Gustafsson
Professor, Plant Molecular Biology

2005

A. Degrees and Positions

Born Nov. 27, 1948

Married, two children, 28 and 24 years old

1977
Ph. D. in Microbiology, Umeå University, Umeå, Sweden

1976 - 1977.
Adjunkt (assistant professor), Molekylær Biologisk Institut, Odense University, Odense, Denmark.

1977 - 1980
Lektor (associate professor), Molekylær Biologisk Institut, Odense Universitet, Odense, Denmark.

1978-1980
Post-doctoral studies, prof. Stanley N. Cohen, Dept. of Genetics, Stanford University, Stanford, California, USA.

1980 -1984
Assistant professor, Dept. of Microbiology, Umeå University, Umeå, Sweden.

1984 - 1986
Associate professor, Dept. of Applied Cell and Molecular Biology, Umeå University.

1986 - present
Professor, Plant Molecular Biology, Dept. of Plant Physiology, Umeå University, Umeå, Sweden.

1991 - 1992
Guest researcher, Dept. of Plant Biology, Carnegie Institution of Washington, Stanford University, California

1993 - 1999
Chairman, Dept. of Plant Physiology, Umeå University, Umeå, Sweden.

1997 - 1999
Chairman, Umeå Institute of Technology, Umeå University Umeå, Sweden.

1999 - 2001
Dean, Faculty of Science and Technology, Umeå University Umeå, Sweden.

2001 – 2004
CEO, SweTree Technologies AB, Umeå, Sweden

2004 –
Vice-President, SweTree Technologies AB, Innovations, Patents and Technology Transfer, Half-time

2005 -
Chairman, Umeå Institute of Technology, Umeå University Umeå, Sweden

B. SCIENTIFIC PUBLICATIONS

Bacterial membranes

1. Gustafsson, P., Nordström, K. and Normark, S. 1973.
   Outer penetration barrier of *Eschericchia coli* K-12: Kinetics of the uptake of gentian violet by wild-type and envelope mutants.
   Journal of Bacteriology **116**: 893-900.

Plasmid replication control and expression vector development

3. Edlund, T., Gustafsson, P. and Wolf-Watz, H. 1976.
   Effect of thymine concentration on the mode of chromosomal replication in *Escherichia coli*.
   Journal of Molecular Biology **108**: 295-303.
4. Gustafsson, P. 1977.
   Control of plasmid R1 DNA replication: Selection and timing of replication and behaviour of conditional mutants.
   Thesis, University of Umeå, Sweden.
5. Gustafsson, P., Nordström, K. and Perram, J. W. 1978.
   Selection and timing of replication and behaviour of plasmids R1*drd-19* and F'*lac* in *Escherichia coli*.
   Plasmid **1**: 187-203.
6. Gustafsson, P. and Nordström, K. 1978.
   Temperature-dependent and amber copy mutants of plasmid R1*drd-19* in *Escherichia coli*.
   Plasmid **1**: 134-144.
7. Molin, S., Stougaard, P., Uhlin, B.-E., Gustafsson, P. and Nordström, K. 1979.
   Clustering of genes involved in replication, copy number control, incompatibility and stable maintenance of the resistance plasmid R1*drd-19*.
   Plasmid **1**: 187-203.
8. Gustafsson, P., Dreissig, H., Molin, S., Nordström, K. and Uhlin, B.-E. 1978.
   DNA replication control: Studies on plasmid R1.
   XLIII Cold Spring Harbor Symposium on Quantitative Biology: DNA, Replication and recombination: 419-425.
9. Uhlin, B.-E., Molin, S., Gustafsson, P. and Nordström, K. 1979.
   Plasmids with temperature dependent copy number for amplification of cloned genes and their products.
   Gene **8**: 91-106.
10. Gustafsson, P. and Nordström, K. 1980.
    Control of plasmid R1 replication: Kinetics of replication in shifts between different copy number levels.
    Journal of Bacteriology **141**: 106-110.
11. Sninsky, J. J., Uhlin, B.-E., Gustafsson, P. and Cohen, S. N. 1981.
    Construction and characterization of a novel two-plasmid system for accomplishing temperature regulated, amplified expression of cloned adventitious genes in *Escherichia coli*.
    Gene **16**: 275-286.

Plasmid partition and expression vector stability

12. Gustafsson, P., Wolf-Watz, H., Lind, L. K., Johansson, K.-E. and Nordström, K. 1983.
    Binding between the *par* region of plasmids R1 and pSC101 and the outer membrane fraction of the host bacteria.
    EMBO Journal **2**: 27-32.
13. Skogman, G., Nilsson, J. and Gustafsson, P. 1983.
    The use of a partition locus to increase stability of tryptophan-operon-bearing plasmids in *Escherichia coli.*
    Gene **23**: 105-115.
14. Miller, C., Tucker, B., Meacock, P., Gustafsson, P. and Cohen, S. 1983.
    Nucleotide sequence of the partition locus of *Escherichia coli* plasmid pSC101.
    Gene **24**: 309-315.

Computer analysis in gene technology

16. Harr, R., Hagblom, P. and Gustafsson, P. 1982.
    Two-dimensional graphic analysis of DNA sequence homologies.
    Nucleic Acids Research **10**: 365-372.
17. Harr, R., Häggström, M. and Gustafsson, P. 1983.
    Search algorithm for pattern match analysis of nucleic acid sequences.
    Nucleic Acids Research **11**: 2943-2957.
18. Harr, R., Fällman, P., Häggström, M., Wahlström, L. and Gustafsson, P. 1986.
    GENEUS, a computer system for DNA and protein sequence analysis containing an information retrieval system for the EMBL data library.
    Nucleic Acids Research **14**: 273-284.

Plant Physiology and Plant Molecular Biology

19. Lönneborg, A., Lind, L. K., Kalla, S. R., Gustafsson, P. and Öquist, G. 1985.
    Acclimation processes in the light harvesting system of cyanobacteria *Anacystis nidulans* following a light shift from white to red light.
    Plant Physiology **78**: 110-114.
20. Lind, L. K., Kalla, S. R., Lönneborg, A., Öquist, G. and Gustafsson, P. 1985.
    Cloning of the beta-phycocyanin gene from *Anacystis nidulans.*
    FEBS Letters **188**: 27-32.
21. Samuelsson, G., Lönneborg, A., Rosenquist, E., Gustafsson, P. and Öquist, G. 1985.
    Photoinhibition and reactivation of photosynthesis in the cyanobacterium *Anacystis nidulans.*
    Plant Physiology **79**: 992-995.
22. Kalla, S. R., Lönneborg, A., Öquist, G. and Gustafsson, P. 1986.
    Light-modulated antennae acclimation in the cyanobacterium *Anacystis nidulans*: Effects of transcriptional and translational inhibitors.
    Journal of General Microbiology **132**: 3195-3200.
23. Samuelsson, G., Lönneborg, A., Gustafsson, P. and Öquist, G. 1986.
    The susceptibility of photosynthesis to photoinhibition and the capacity of recovery in high and low light grown cyanobacteria *Anacystis nidulans.*
    Plant Physiology **83**: 438-441.
24. Lind, L. K., Kalla, S. R., Lönneborg, A., Öquist, G. and Gustafsson, P. 1987.
    Organization of the phycocyanin gene cluster in *Anacystis nidulans.*
    Acta Chemica Scandinavica **B41**: 112-115.
25. Öquist, G., Samuelsson, A., Lönneborg, A. and Gustafsson, P. 1987.
    Photoinhibition and recovery of photosynthesis in *Anacystis nidulans.*
    Acta Chemica Scandinavica **B41**: 108-111.

26. Lidholm, J., Gustafsson, P. and Öquist, G. 1987.
Photoinhibition of photosynthesis and its recovery in the green alga *Chlamydomonas reinhardii.*
Plant Cell Physiology **28**: 1133-1140.
27. Lidholm, J., Szmidt, A., Hällgren; J.-E. and Gustafsson, P. 1988.
The chloroplast genome of conifers lack one of the rRNA-encoding inverted repeats.
Molecular and General Genetics **212**: 6-10.
28. Kalla, S. R., Lind, L. K., Lidholm, J., Öquist, G. and Gustafsson, P. 1988.
Two actively transcribed phycocyanin subunit genes in the cyanobacterium *Anacystis nidulans.*
Journal of Bacteriology ***170***: 2961-2970.
29. Lönneborg, A., Kalla, S. R., Samuelsson, G., Gustafsson, P. and Öquist, G. 1988.
Light-regulated expression of the *psbA* transcript in the cyanobacterium *Anacystis nidulans.*
FEBS Letters **240**: 110-114.
30. Kalla, S. R., Lind, L. K. and Gustafsson, P. 1989.
Genetic analysis of phycobilisome mutants in the cyanobacterium *Synechococcus* 6301.
Molecular Microbiology **3**: 339-347.
31. Jansson, S. and Gustafsson, P. 1990.
Type I and Type II genes for the chlorophyll *a/b*-bindning protein in the gymnosperm *Pinus sylvestris* (Scots pine): cDNA cloning and sequence analysis.
Plant Molecular Biology ***14***: 287-296.
32. Jansson, S. Selstam, E. and Gustafsson, P. 1990.
The rapidly phosphorylated 25kD polypeptide of the light-harvesting complex of photosystem II is encoded by the Type 2 *cab-II* genes.
Biochim. Biophys. Acta, **1019**: 110-114.
33. Krupa, Z., Öquist, G. and Gustafsson, G. 1990.
Photoinhibition and recovery of photosynthesis in *psbA* gene-incativated strains of cyanobacterium *Anacystis nidulans.*
Plant Physiology **93**: 1-6.
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Duplication of the *psbA* gene in the chloroplast genome of to *Pinus* species.
Molecular and General Genetics **226**: 345-352.
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The chloroplast genome of the gymnosperm *Pinus contorta*: A physical map and a collection of overlapping clones covering the entire genome.
Current Genetics **20**: 161-166.
36. Gustafsson, P., Jansson, S., Lidholm, J. and Lundberg, A.-K. 1991
Structure and regulation of photosynthesis genes in *Pinus sylvestris* (Scots pine) and *Pinus contorta* (Lodgepole pine).
Forest Ecology Management **43**: 287-300.
37. Bhalerao, R. P., Gillbro, T. and Gustafsson, P. 1991.
Structure and energy transfer of the phycobilisome in a linker replacement mutant of cyanobacterium *Synechococcus* 7942.
Biochimica Biophysica Acta **1060**: 59-65.
38. Lidholm, J. and Gustafsson, P. 1991
A three-step model for the rearrangment of the chloroplast *trnK-psbA* region of the gymnosperm *Pinus contorta.*
Nucleic Acids Research **19**: 2881-2887.
39. Krupa, Z., Öquist, G. and Gustafsson, G. 1991
Photoinhibition of photosynthesis and growth responses at different light levels in *psbA* gene mutants of the cyanobacterium *Synechococcus.*
Physioliga Plantarum **82**: 1-8.

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Evolutionary conservation of the chlorophyll *a/b*-binding proteins: cDNAs encoding Type I, II and III LHC I polypeptides from the gymnosperm Scots pine.
Molecular and General Genetics **229**: 67-76.
41. Lidholm, J. and Gustafsson, P. 1991
Homologues of the green algal *gidA* gene and the liverwort *frxC* gene are present on the chloroplast genomes of conifers.
Plant Molecular Biology **17**: 787-798.
42. Jansson, S., Virgin, I., Gustafsson, P., Andersson, B. and Öquist, G. 1992
Light-induced changes of photosystem II activity in dark-grown Scots pine seedlings.
Physiologia Plantarum **84**: 6-12.
43. Lidholm, J. and Gustafsson, P. 1992.
A transcriptional analysis of the chloroplast *trnK-psbA-trnH* region of two *Pinus* species: evidence for a transcriptional fusion between a novel *psbA* gene copy and the *trnK*(UUU) gene in *Pinus contorta*.
Plant Journal **2**: 875-886.
44. Sellstedt, A., Wullings, B., Nyström, U., and Gustafsson, P. 1992.
Identification of *Casuarina-Frankia* strains by use of polymerase chain reaction (PCR) with arbitrary primers.
FEMS Microbiological Letters **93**: 1-6.
45. Bhalerao, R. P., Lind, L. K., Persson, C. and Gustafsson, P. 1993.
Cloning of the phycobilisome rod linker genes from the cyanobacterium *Synechococcus* sp. PCC 6301 and their inactivation in Synechococcus sp. PCC 7942.
Molecular and General Genetics **237**: 89-96.
46. Kalla, S. R., Bhalerao, R. P. and Gustafsson, P. 1993.
Regulation of the phycobilisome rod proteins and mRNA at different light intensities in the cyanobacterium *Synechococcus* 6301.
Gene **126**: 77-83.
47. Landvik, S., Ericksson, O. E., Gargas, A. and Gustafsson, P. 1993.
Relationship of the genus *Neolecta* (*Neolectales* ordo nov., *Ascomycotina*) inferred from 18S rDNA sequences.
Systema Asocmycetum **11**: 107-118.
48. Clarke, A., K., Soitamo, A., Gustafsson, P., and Öquist, G. 1993.
Rapid interchange between two distinct forms of cyanobacterial photosystem II reaction-center protein D1 in response to photoinhibition.
Proceedings of the National Acadamy of Sciences, USA **90**: 9973-9977.
49. Bhalerao, R. P., and Gustafsson, P. 1994.
Factors influencing the phycobilisome rod composition of the cyanobacterium *Synechococcus* sp. PCC 7942: Effects of reduced phycocyanin content, lack of rod-linkers and over-expression of the rod-terminating linker.
Physiologia Plantarum **90**: 187-197.
50. Bhalerao, R. P., Lind, L. K., and Gustafsson, P. 1994.
Cloning of the *cpcE* and *cpcF* genes from *Synechococcus* sp. PCC 6301 and their inactivation in *Synechoccus* sp. PCC 7942
Plant Molecular Biology **26**: 1-14.
51. Clarke, A., K., Hurry, V., M., Gustafsson, P., and Öquist, G.. 1993.
Two functionally distinct forms of the photosystem II reaction-center protein D1 in the cyanobacterium *Synechococcus* sp. PCC 7942.
Proceedings of the National Acadamy of Sciences, USA **90**: 11985-11989.
52. Gustafsson, L. and Gustafsson, P. 1994.
Low genetic variation in Swedish populations of the rare species *Vicia pisiformis* (Fabaceae) revelaed with rflp (rDNA) and PCR (random priming).
Plant Systematics and Evolution **189**: 133-148.

53. Bhalerao, R. P., Collier, J. L., Gustafsson, P. and Grossman, A. R. 1995.
The structure of phycobilisomes in mutants of *Synechococcus* sp. PCC 7942 devoid of specific linker polypeptides.
Photochemistry and Photobiology **61**: 298-302.
54. Soitamo, A., Zhou, G., Clarke, A. C., Öquist, G., Aro, E.-M. and Gustafsson, P. 1994.
Over-production of the D1 protein of photosystem II reaction centre in the cyanobacterium *Synechococcus* sp. PCC 7942.
Plant Molecular Biology **26**: 709-721.
55. Król, M., Spangfort, M. D., Huner, N. P. A., Öquist, G., Gustafsson, P. and Jansson, S. 1995.
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Plant Physiology **107**: 873-883.
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Characterization of cDNAs corresponding to two *Lhcb4* alleles from Scots pine (*Pinus sylvestris*).
Plant Physiology **106**: 1693-1694.
57. Jansson, S and Gustafsson, P. 1994.
Characterization of a *Lhcb5* cDNA from Scots pine (*Pinus sylvestris*).
Plant Physiology **106**: 1695-1696.
58. Clarke, A. C., Gustafsson, P. and Lidholm, J. Å. 1994.
Identification and expression of the chloroplast *clpP* gene in the conifer *Pinus contorta*.
Plant Molecular Biology **26**: 851-862.
59. Bhalerao, R. P., Gillbro, T. and Gustafsson, P. 1994.
Functional phycobilisome core in a phycocyanin-less mutant of cyanobacterium *Synechococcus* sp. PCC 7942.
Photosynthetic Research **45**: 61-70.
60. Campbell, D., Zhou, G., Gustafsson, P., Öquist, G. and Clarke, A., K. 1995.
Electron transport regulates exchange of two forms of Photosystem II D1 protein in the cyanobacterium *Synechococcus* sp. PCC 7942.
EMBO Journal **14**: 5457-5466.
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Dynamic responses of photosystem II and phycobilisomes to changing light in the cyanobacterium *Synechococcus* sp. PCC 7942.
Planta **197**: 553-562.
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Two forms of the photosystem II D1 protein alter energy dissipation and state transitions in the cyanobacterium *Synechococcus* sp. PCC 7942.
Photosynthetic Research, 1-14.
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Acta Physiologia Plantarum **17**: 191-197.
64. Öquist, G., Campbell, D., Clarke, A. K., and Gustafsson, P. 1995.
The cyanobacterium *Synechococcus* modulates PS II function in response to excitation stress through D1 exchange.
Photosynthesis Research, **46**: 151-158.
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Over-production of the D1:2 protein makes *Synechococcus* cells more tolerant against photoinhibition of photosystem II.
Plant Molecular Biology, **30**: 467-478.
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D1 exchange and the Photosystem II repair cycle in the cyanobacterium *Synechococcus.*
Plant Science **120**: 1-8.
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RAPD and morphological analysis of the rare plant species, *Vicia pisiformis* (Fabaceae)
Biological Journal of the Linnean Society, **61**: 325-343.

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Antenna protein composition of PSI and PSII in thylakoid sub-domains.
Biochimica et Biophysica Acta, **1320**: 297-309.
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Plant J., **12**: 605-614.
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Proc. Natl. Acad. Sci., USA, **95**: 364-369.
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Microbiology and Molecular Biology Reviews, **62:** 667-683 .
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Proc. Natl. Acad. Sci., USA, **95**: 13330-13335.
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Molec. Microbiol., **32:** 123-129.
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Physiol. Plantarum., **105**: 746-755.
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Plant Physiol., **119:** 1387 - 1397.
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AgBiotechNet **3:** 1 – 5.
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Physiol. Plantarum., **116**: 255-263.
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Archives in Microbiology. **183**: 66-69.
87. Mouillon, J.-M., Gustafsson, P. And Harryson, P.. 2006.
Structural investigation of disordered stress proteins: comparison of full-length Dehydrins with isolated peptides of their conserved segments.
Plant Physiol., **141**: 638-650.

C. OTHER SELECTED ARTICLES

1. Gustafsson, P. and Sitbon, F. 1986.
Studies on the genetic differences between pine species by modern DNA technology: The nuclear genome.
Frans Kempe Symp.: 253-268.
2. Jansson, S. and Gustafsson, P. 1988.
Cloning of a cDNA encoding the light-harvesting chlorophyll *a/b*-binding protein (Cab) from Scots pine (*Pinus sylvestris* L.)
In: *Molecular Genetics of Forest Trees*, Eds Cheliak and Yapa, PNFI vol PI-X-80: 19-25.
3. Sitbon, F. and Gustafsson, P. 1988.
Cloning and characteriaztion of a highly conserved, *Pinaceae* specific chloroplast DNA component from Scots pine.
In: *Molecular Genetics of Forest Trees*, Eds Cheliak and Yapa, PNFI vol PI-X-80: 41-47.
4. Lidholm, J., Szmidt, A. E. and Gustafsson, P. 1988.
Duplication of the *psbA* gene but lack of one of the rRNA encoding repeats on the chloroplast genome of lodgepole pine, *Pinus contorta*.
In: *Molecular Genetics of Forest Trees*, Eds Cheliak and Yapa, PNFI vol PI-X-80: 67-74.
5. Lidholm, J., Jansson, S., Szmidt, A. E. and Gustafsson, P. 1988.

Structure and regulation of photosynthesis genes in *Pinus sylvestris* and *Pinus contorta*.
Kempe symp 1988: 115-126.

6. Ögren, E., Andersson, B., Gustafsson, P., Huss-Danell, K., Jensen, P., Sandberg, G. och Öquist, G. 1990.
Bioenergi från växter: Strategisk grundfroskning för framtiden. I Energi och miljö: Forskare om framtidens energisystem, debattskrift från Kungliga Vetenskapsakademien.

D. DISSERTATIONS

1. Anders Lönneborg, Ph D, 10/10, 1986
Light antennae acclimation and photoinhibition/reactivation of photosynthesis in the cyanobacterium *Anacystis nidulans*: Studies using methods in physiology and molecular genetics
Opponent appointed by the faculty: Dr Arthur Grossman, Carnegie Institution, Stanford.
2. Roger Kalla, Ph D, 29/4, 1988
Acclimation of light-harvesting antennae in the cyanobacterium *Synechococcus* 6301: Transcriptional organization and coordination of gene expression of the phycobilisome rod operon.
Opponent appointed by the faculty: Prof Peter Weisbeek, University of Utrecht, Holland
3. Lisbet Lind, Ph D, 4/11, 1988
Cloning and characterization of genes for light-harvesting polypetides in *Synechococcus* 6301.
Opponent appointed by the faculty: Dr Susan Golden, Texas A&M University, USA
4. Jonas Lidholm, Ph D, 27/3, 1992
The chloroplast genome of *Pinus contorta* Dougl.: Studies of structure, rearrangements and gene content.
Opponent appointed by the faculty: Dr Wolfgang Löffelhardt, Vienna University, Austria
5. Stefan Jansson, Ph D, 27/11, 1992
The chloroplast *a/b*-binding proteins: Studies on the *Lhca* and *Lhcb* genes of Scots pine.
Opponent appointed by the faculty: Dr John Allen, Lund University, Sweden
6. Rishikesh P. Bhalerao, Ph D, 10/9, 1993
The phycobilisome rod in the cyanobacterium *Synechococcus* sp. PCC 7942: A mutational analysis of structure, assembly and energy transfer.
Opponent appointed by the faculty: Dr Christer Jansson, Stockholm University, Sweden
7. Guoqing Zhou, Ph D, 15/3, 1996
Regulation of the *psbA* gene family and repair cycle of photosystem II in the cyanobacterium *Synechococcus.*
Opponent appointed by the faculty: Dr Anders Lönneborg, NISK, Ås, Norway
8. Arto Soitamo, Ph D, Åbo University, Åbo, Finland, 27/9, 1997
Over-expression and regulation of *psbA* genes in cyanobacterium *Synechococcus* sp. PCC 7942.
Opponent appointed by the faculty: Dr Christer Jansson, Stockholm University, Sweden
9. Åsa Strand, Ph D, 19/5, 2000
Metabolic acclimation to low temperatures in *Arabidopsis thaliana* – how to make metabolism move
Opponent appointed by the faculty: Dr Thomas Sharkey, Dept. of Botany, University of Wisconsin, Madison, USA.
10. Stefan Sandström, Ph D, 15/6, 2001
Iron deficiency responses of photosynthesis in the cyanobacterium *Synechococcus* sp. PCC 7942
Opponent appointed by the faculty: Dr Conrad Mullineaux, Kings College, London, UK.
11. Rupali Bhalerao, Ph D, 10/10, 2003
Gene finding in Populus – The bioinformatics of an EST program
Opponent appointed by the faculty: Dr Sean May, Plant Science Division, School of Biosciences, University of Nottingham, Loughborough, UK.
12. Ulrika Ganeteg, Ph D, 2/4, 2004
The light-harvesting antenna of higher plant photosystem IOpponent appointed by the faculty: Prof. Francis-André Wollman, Laboratorie de Physiologie Membranaire et

Moléculaire du Chloroplaste, Institute de Biologie Physico-Chimique, Service de Photosynthèse, Paris, France.

E. GRANTS

1. **VR** Swedish Natural Science Research Council, Principal investigator
   Since 1982
   The Photosynthetic Light Antenna: Molecular structure, function and regulation
   942.166 SEK, 1999

2. **SJFR** Swedish Research Council for Agriculture and Forestry, Principal investigator
   Since 1986
   Co-PI, dr. Stefan Jansson
   The Photosynthetic genome: The function of the 10 different chlorophyll a/b-binding proteins in the plant light antenna
   413.000 SEK, 1999

3. **TFR** Swedish Technical Research Council, Principal investigator
   Since 1992
   Co-PI's, profs. Per Gardeström, Jan-Erik Hällgren, Olof Olsson, Göran Samuelsson, Göran Sandberg and Gunnar Öquist.
   Forest Biotechnology
   1,8 MSEK 1999

4. **SSF** Foundation for Strategic Research, Co-PI (PI prof. Göran Sandberg, Umeå)
   Since 1995, 5 to 10 year grant
   Forest Biotechnology and Chemistry
   8 MSEK 1996, 11 MSEK 1997, 13 MSEK 1998

5. **SSF** Foundation for Strategic Research, Co-PI (PI prof. Mathias Uhlen, Stockholm)
   Since 1998
   Genome Research Center
   500.000 SEK 1999

6. **Knut and Alice Wallenberg**, Co-PI (PI prof Tuula Teeri, Stockholm)
   Since 1998
   Wallenberg Wood Biotechnology Center
   500.000 SEK 1999

7. Numerous smaller grants from different agencies

F. INDUSTRIAL ACTIVITIES

Co-founder of the company Symbicom AB, 1984. Sold to Astra-Hässle 1994.

Co-founder of the company SweTree Technologies AB, 2000.

Co-founder of the company Woodheads AB, 2000.

CEO of SweTree Technologies AB, 2001 – 2004.

Responsible for innovation scouting, Technology aquisitiona and Technology Transfer in SweTree Technologies AB, 2004 -

G. TEACHING

From 1990 and present:

1. Plant Molecular Biology
   Course organizer and main teacher for a yearly advanced 10 week course in Plant Molecular Biology. Usually attracts 10 - 15 students during their third or fourth year of undergraduate studies.

2. Cell and Molecular Biology
   One of the persons responsible for modernizing the undergraduate teaching in cell and molecular biology for biology and molecular biology students at Umeå University in 1990 - 1991.

3. University engineers, Technical biology (Civilingenjörsutbildning, Teknisk biologi)
   Chairman in the committe that since 1994 is responsible for the new very popluar education in Technical biology at our University. 800 applicants to 30 places last year.

H. FORMAL ENGAGEMENTS

From 1992 and present:

1. Utsedd av **Danska forskningsrådet** att medverka i en internationell utvärdering av **Lettlands** forskning, 1992

2. Ansvarig för **utbildningsminister Per Unckels** besök i North Carolina, hösten 1993

3. Utsedd av Umeå universitet att ta fram ett förslag till forskarskola i "Molekylärbiologi och Strukturkemi, 1994 - 1995

4. Ledamot av styrelsen för Svenska Föreningen för Mikrobiologi, 1985 - 1996.

5. Medlem i forskningsrådens EU-kommitte för bioteknologi, 1992 - 1997.

6. Medlem av forskningsgruppen i **NUTEKs** utredning Biologi och teknik i samverkan BoTiS 2010, 1994 - 1995

7. Medlem av styrgruppen i **NUTEKs** utredning Biologi och teknik i samverkan, BoTiS 2010, 1994 - 1995

8. Ledamot **av Teknikvetenskapliga forskningsrådets, TFR**, styrelse, 1992 - 1995

9. Ledamot av **Teknikvetenskapliga forskningsrådets, TFR**, prioriteringsgrupp i **bioteknik**, 1992 - 1998.

10. **Ordförande** för planeringsgruppen för civilingenjörsutbildningen i **Teknisk biologi**, Umeå universitet, 1997 – 1999.

11. **Vice ordförande** i styrelsen för Umeå universitets datacentral, UMDAC, sedan 1992

12. Medlem i **Bioscience**-gruppen i **Stiftelsen för strategisk forskning, SSF,**1994 - 1998

13. **Ordförande i Tekniska Högskolan vid Umeå Universitet,** 1997-1999.

14. **Dekan för den Teknisk-Natutvetenskapliga fakulteten vid Umeå universitet,** 1999 - 2001.

15. Ledamot av **Vetenskapsrådets, VR**, prioriteringsgrupp i **bioteknik**, 2001 -2003.

16. Ledamot av **Stiftelsen för Internationalisering, STINT**, 2001 - 2004.

17. Ledamot av **Regeringens Forskningsberedning** under ledning av Thomas Östros, 2002 – 2004.

18. Ledamot av **forskingskommitten, Stiftelsen för Strategisk Forskning**, 2003 -

19. Ledamot, utvärderingsgrupp "**Framtidens forskningsledare**" (Ingvar Grant), **Stiftelsen för Strategisk Forskning**, 2004.

19. **Ordförande** i **Tekniska Högskolan vid Umeå Universitet,** 2005 -

I. ORGANIZER OF SCIENTIFIC CONGRESSES AND WORKSHOPS

From 1988:

1. The 6th International Congress of Photosynthesis, Stockholm, 1988. 800 participants
   Member of both the scientific and organizing committes
2. IUFRO Workshop in Forest Molecular Biology, Riksgränsen, 1989. 40 participants.
   Responsible organizer.
3. Annual meeting af the Swedish Society for Microbiology, UMeå, 1990. 200 participants.
   Responsible organizer together with prof. Glenn Björk.
4. NOMBA-NYRP workshop, Storlien, 1990.
   Member of the scientific committe.
5. The International FESPP (Federation of the European Societies for Plant Physiologists) congress in Umeå, 1991. 1200 participants.
   Member of both the scientific and organizing committes.
6. 21th Meeting of the Federation of European Biochemical Societies" (FEBS), Sverige 1993.
   Member of the scientific committe.
7. Nordisk forskarkurs, Plant Stress and Function, 1995.
   Member of the scientific committe.
8. Annual meeting af the Swedish Society for Microbiology, Umeå, 1996. 300 participants.
   Responsible organizer together with prof. Sven Bergström.
9. Scandinavian Society of Photosynthesis, in Umeå, 2002. 200 participants.
   Chairman and responsible organizer.
10. Scandinavian Society for Plant Physiology, SPPS, bi-annual meeting, in Umeå 2005.
    Member of the scientific and organizing committe.
    Responsible organizer of the workshop "Genetic variations in Natural Populations" within the meeting.

LATEST NEWS WEEK 44 – 2004

Growth of the fungi Trametes and Chalara

After analysis of the growth curves of the fungal mix the following can be said:

If one starts with 120 grams of each of the fungus in 100 litres of composed hydrolysate we can obtain 5000 grams of each fungus after 13 days, and after 4.4 days in 500 litres.

Ethanol production Table 1.

Fungi	WH*	Yeast	Analysed after hour	Ethanol in g/l (gram/litre)
None	Domsjö	Ours	40	6.12 ±0.27
None	Domsjö	Domsjö	40	6.10 ±0.20
Chalara	Domsjö	None	24	7.49 ±0.24
Chalara	Domsjö	None	40	9.7 ±1.79
Chalara	Domsjö	Domsjö	24	7.65± 0.31
Chalara	Domsjö	Domsjö	40	7.41 ±0.6
Chalara	Domsjö	Ours	40	6.14 ±0.11
Trametes + Chalara	Domsjö	Ours	24	24.61 ±2.09
Trametes + Chalara	Domsjö	None	24	14.00 ±1.61

Composition of WH before and after ethanol production, Table 2.

Experiment 1 and 2 are performed in batch culturing at Fys. Bot., UPSC and experiment 3 and 4 are done at the Domsjö Fabriker AB in a flow through system. The analyses of the sugar composition were done at MoResearch.

Domsjö Lut (g/l)	Glucose	Mannose	Xylose	Arabinose	Galactose
1 Before	9.7	27	11	0.69	4.7
2 After	0.54	14	7.9	0.42	3.5
3 Before	9.26	25.50	10.47	0.48	5.32
4 After	0.19	0.59	9.02	0.48	3.49

PLANNING

1. We have started growth in large scale of Trametes and **

[*The Swedish word "Lut" is the nick name for WH = wood hydrolysate obtained from sulphite spent liquor. Domsjö Fabriker AB is a factory in Sweden where the results were obtained. MoResearch is a separate research unit at this factory.
**The planning sentence should end with Chalara.]

Experimental data Week 43-2008
Table

Ethanol production in spent sulphite liquor (SSL) by combinations of *Chalara parvispora*, *Trametes versicolor* and *Saccharomyces cerevisae*. Ethanol production was analyzed after 48h shaking in 27°C, mean ± SD, n=4.

Fungi	Ethanol produced g/l, mean ± SD	amount of fungi g/l
Chalara parvispora	8.45 ± 1.18	2,0
Trametes versicolor	9,18 ± 0,58	2,0
C. parvispora + *T. Versicolor*	15.90 ± 0,71	1,0 1,0
S.cerevisae + *C. parvispora* + *T. versicolor*	25.00 ± 0,50	0,8 1,0 1,0
S. cerevisae	7,80 ± 0,40	0,8

The fungi *Chalara parvispora* and *Trametes versicolor* were grown in SeHo medium as described in (Patent WO-2005054487) and (Holmgren & Sellstedt, 2008), transferred to new medium three days before the start of the experiment, and kept shaking in 27°C, 110 rpm. *Saccharomyces cerevisae* was grown in a YEP-s medium, 37 °C for 24h, shaking 24h at 132 rpm as described in Holmgren & Sellstedt (2008). One ml samples were taken from the bottles with the fungi and the yeast, and were centrifuged (5 min, 14000 rpm) to determine the amount of cells in one ml. That measure was then used to determine the amount from the growth bottle to use in each experimental set. A second centrifugation was performed, using a small doctors centrifuge (5400, 10 min) to reduce the volume of the media, so that it would not make any impact on the experiment. One ml of the medium was left in the tube and the pellet was then dissolved in spent sulphite liquor.
Four replicates of each fungi + fungal mixture was put together with the SSL in 100 ml bottles and after 48h shaking in 27°C, 2 ml samples were taken and 1 mikroliter of that sample was analyzed by GC as described in (Patent WO-2005054487) and (Holmgren & Sellstedt, 2008).
A standard curve was made with known amount of ethanol ranging from 0, 0.5, 1.0, 2.0, 3.0, 4.0 and 5.0%. The R^2=0.99, equation was y=0,0784x.